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Figure 9 is a schematic, vertical sectional view showing an optical element according to another aspect of the present invention; and

Figure 10 is a simplified schematic of a phase error corrector configured as a diffractive element.

Please replace the paragraph beginning at page 12, line 7 with the following rewritten paragraph:

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The example given herein is a refractive phase error corrector, but the concept can easily be extended to a reflective phase error corrector which would eliminate any potential chromatic aberration problems. Moreover, the present invention contemplates that the phase error corrector is a diffractive element 30' (see FIG. 10), such as a holographic device. Whether reflective, refractive or holographic the invention uses the corrector plate, with little or no power at or near the intermediate focus of the collector telescope to control distortion in a proscribed manner to eliminate the phasing error over the field of view in a distributed aperture telescope system.

IN THE CLAIMS:

Please cancel claims 1-11, 18-26, and 30-32 without prejudice and enter new claims 34-66 as follows:

1 - 11, 18 - 26, and 30 - 32 (Canceled).

12 - 17, 27 - 29, and 33 (Non-Elected).

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34. (New) A distributed-aperture telescope having a distributed aperture, the distributed-aperture telescope comprising:

a plurality of three mirror anastigmats (TMAs) positioned within the distributed aperture, wherein each TMA includes:

a primary mirror device, the primary mirror device being configured to receive electromagnetic radiation from one or more sources;

a secondary mirror device coupled to the primary mirror device, the secondary mirror device being configured to redirect a portion of the electromagnetic radiation reflected from the primary mirror device;

a tertiary mirror device coupled to the secondary mirror device, the tertiary mirror device being configured to redirect a portion of the electromagnetic radiation from reflected the secondary mirror device;

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an intermediate image plane disposed between the secondary mirror device and the tertiary mirror device; and

a phase plate disposed within a vicinity of the intermediate image plane, wherein the phase plate is configured to adjust a phase relationship of the portion of the electromagnetic radiation associated with a resulting image.

35. (New) The distributed-aperture telescope of claim 34, wherein each phase plate is a phase-error corrector.

36. (New) The distributed-aperture telescope of claim 34, wherein each phase plate is configured to reduce a sine magnification error associated with the phase relationship.

37. (New) The distributed-aperture telescope of claim 34, wherein the phase plates are configured to reduce distortion of the resulting images.

38. (New) The distributed-aperture telescope of claim 34, wherein each phase plate is a refractive element or a diffractive element.

39. (New) The distributed-aperture telescope of claim 34, wherein each phase plate has substantially no optical power.

40. (New) The distributed-aperture telescope of claim 34, wherein the primary mirror device is disposed between the second mirror device and the tertiary mirror device.

41. (New) The distributed-aperture telescope of claim 34, wherein:

each TMA further includes a fold flat mirror having a central aperture formed therein, and

the phase plates are disposed within the central apertures formed in the fold flat mirrors.

42. (New) The distributed-aperture telescope of claim 34, wherein:

each primary mirror device has a central aperture formed therein; and

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a portion of the electromagnetic radiation reflected from the secondary mirror devices passes through the central apertures formed in the primary mirror devices.

43. (New) The distributed-aperture telescope of claim 34, wherein the intermediate image planes are disposed between the primary mirror devices and the tertiary mirror devices.

44. (New) The distributed-aperture telescope of claim 34, wherein each phase plate includes a refractive element that has a flat surface and a corrector surface.

45. (New) The distributed-aperture telescope of claim 44, wherein each corrector surface is defined by a rotationally symmetric polynomial.

46. (New) The distributed-aperture telescope of claim 45, wherein the rotationally symmetric polynomial is of the general form

$$z = \frac{cy^2}{1+\sqrt{1-(k+1)c^2y^2}} + Dy^4 + Ey^6 + Fy^8 + Gy^{10}$$

where z is height, y is a radial coordinate, D, E, F, G, C and K are aspheric coefficients that are varied during a design process to effectively minimize the sine magnification errors, c is a vertex curvature, and k is a conic constant.

47. (New) The distributed-aperture telescope of claim 34, wherein each phase plate is positioned approximately at or within about 50 millimeters of a corresponding intermediate image plane.

48. (New) The distributed-aperture telescope of claim 34, wherein the distributed aperture is about 44.6 meters.

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49. (New) A distributed aperture optical system comprising:

a plurality of collector telescopes, each having an image plane at which images are formed; and

a plurality of phase plates corresponding to the plurality of collector telescopes, each phase plate is disposed approximately at or near the image plane of a corresponding collector telescope and has a surface adapted to adjust phase relationships of the images.

50. (New) The distributed aperture optical system according to claim 46, wherein the phase relationships include sine magnification errors.

51. (New) The distributed aperture optical system according to claim 46, wherein each phase plates is a phase error corrector configured to correct sine magnification errors.

52. (New) The distributed aperture optical system according to claim 49, wherein the images are intermediate images.

53. (New) The distributed aperture optical system according to claim 49, wherein the image planes are intermediate image planes.

54. (New) The distributed aperture optical system according to claim 49, wherein each phase plate is positioned approximately at or within about 50 millimeters of a corresponding image plane.

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55. (New) The distributed aperture optical system according to claim 49, wherein each phase plate is a refractive element or a diffractive element.

56. (New) The distributed aperture optical system according to claim 49, wherein each phase plate has substantially no optical power.

57. (New) The distributed aperture optical system according to claim 49, wherein each collector telescope further includes:

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a primary reflector having a central aperture formed therein,

a secondary reflector optically coupled to the primary reflector,

a tertiary reflector having a central aperture formed therein and optically coupled to the secondary reflector, and

a fold flat mirror having a central aperture formed therein and optically coupled to the tertiary reflector, wherein the flat fold mirror is disposed in an optical path near the central aperture formed in the primary reflector, and wherein the tertiary reflector is configured to reflect light passing through the central aperture formed in the fold flat mirror to the fold flat mirror, and wherein the phase plates are disposed within the central apertures formed in the fold flat mirrors.

58. (New) The distributed aperture optical system according to claim 49, wherein each phase plate is a refractive element having a flat surface and a corrector surface configured to correct for sine magnification errors associated with the phase relationships of the images.

59. (New) The distributed aperture optical system according to claim 58, wherein the corrector surface is defined by a rotationally symmetric polynomial.

60. (New) The distributed aperture optical system according to claim 59, wherein the polynomial is of the general form

$$z = \frac{cy^2}{1+\sqrt{1-(k+1)c^2y^2}} + Dy^4 + Ey^6 + Fy^8 + Gy^{10}$$

where z is height, y is a radial coordinate, D, E, F, G, C and K are aspheric coefficients that are varied during a design process to effectively minimize the sine magnification errors, c is a vertex curvature, and k is a conic constant.

61. (New) A method of adjusting a phase relationship in a distributed aperture optical system comprising:

receiving electromagnetic radiation from one or more sources at a first mirror device;

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receiving a portion of the of the electromagnetic radiation reflected from the first mirror device at a second mirror device;

transmitting a portion of the electromagnetic radiation reflected from the second mirror device through a phase plate this is configured to approximately phase the electromagnetic radiation transmitted through the phase plate to reduce distortion in a resulting image; and

receiving a portion of the electromagnetic radiation transmitted through the phase plate at a third mirror device.

62. (New) The method of claim 61, further comprising receiving a portion of the electromagnetic radiation reflected from the tertiary mirror at a fold flat mirror having an aperture formed therein.

63. (New) The method of claim 61, wherein the distortion is associated with a sine magnification error.

64. (New) The method of claim 61, further comprising phasing a portion of the electromagnetic radiation transmitted through the phase plate to approximately phase the electromagnetic radiation forming the resulting image.

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65. (New) The method of claim 61, wherein the phase plate is a phase error corrector.

66. (New) The method of claim 61, wherein the phase plate is approximately non-optically powered.

IN THE DRAWINGS:

New Figure 10 has been submitted for the Examiner's approval.